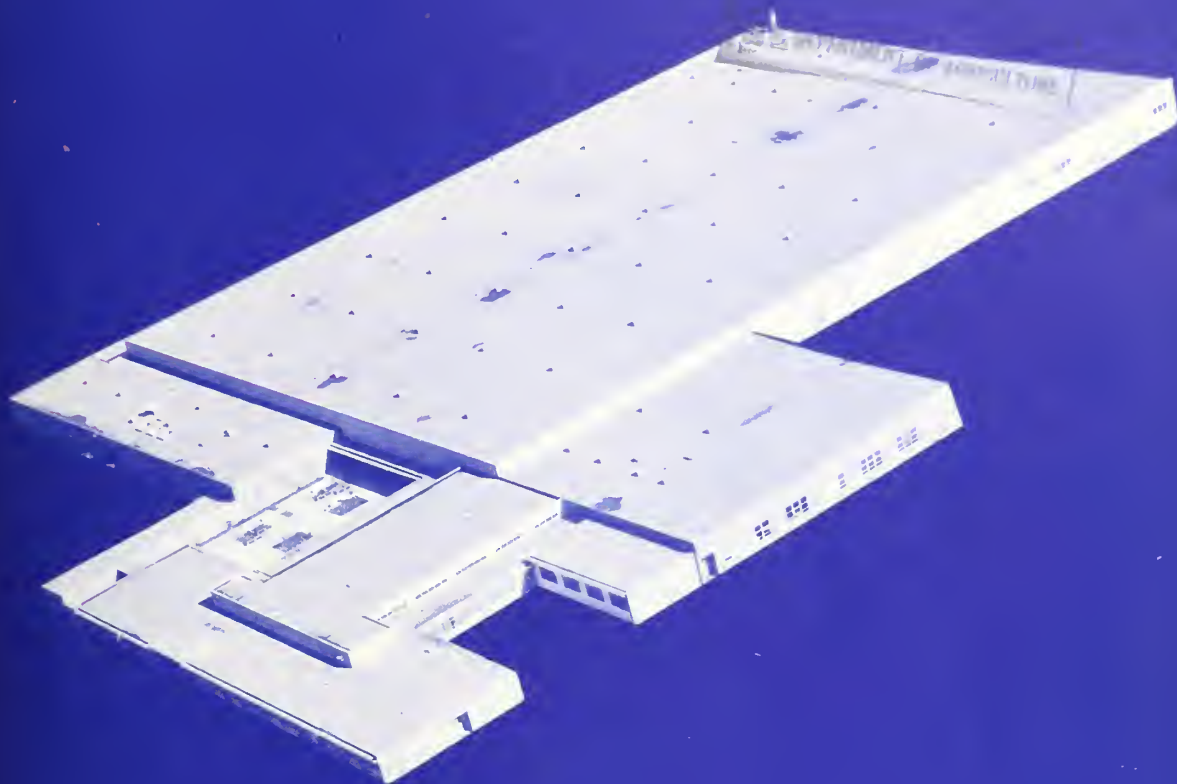


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MARKETING RESEARCH REPORT NO. 332



INTEGRATING EGG PRODUCTION AND MARKETING

MARKETING RESEARCH DIVISION - AGRICULTURAL MARKETING SERVICE

U. S. DEPARTMENT OF AGRICULTURE

PREFACE

This is a report of a pilot study of programs that coordinate the production and marketing of eggs in the United States. It is based on interviews with operators of coordinated programs in most of the important egg producing sections of the country. It is believed that the sample group is representative of the kinds of programs in effect in 1958.

All of the organizations studied represented some degree of vertical integration. Most highly integrated was a firm which produced most of its grain, manufactured its feed, produced hatching eggs from its own breeding flock, hatched and grew flock replacements, made much of its equipment, and produced, graded, cartoned, and wholesaled market eggs. Least integrated were firms which produced eggs and assembled them for market.

Changes in production patterns and the marketing structure for eggs are occurring so rapidly that conclusions here concerning programs of the future must be considered tentative.

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Program operators and participants provided basic data, background information, and freely discussed problems in connection with their programs. Suggestions from H. M. Southworth and G. E. Brandow, Pennsylvania State University, were especially helpful in revising the manuscript.

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SUMMARY

Open market pricing of eggs has failed to solve many of the problems of quality-control and seasonal distribution of production. Conventional production and distribution methods also result in higher costs of production and marketing than appear possible with more highly integrated operations.

Market operators, feed companies, and producers have developed contract marketing and quality-control, contract production, and owner-integrated programs to help solve quality, supply, and cost problems.

Contract marketing and quality-control programs involve contracts to market eggs on a specification basis. They operate in all sections of the United States. They emphasize production practices to obtain uniformly high quality eggs and usually pay producers a premium for these eggs.

Contract marketing and quality-control programs accounted for approximately 10 percent of the Nation's eggs in 1958. Continued expansion of these programs can be expected, particularly in the Northeast, Midwest, and Far West.

Contract production programs involve a contract to produce eggs under specified conditions. They operate largely in the Southern States. They, too, emphasize high quality eggs. The pullets and feed are furnished producers by the program operator. Producers furnish housing facilities and labor. The eggs belong to the program operator. Producers are usually paid on the basis of the number of eggs produced with bonuses for high or efficient production.

Contract production programs probably accounted for less than 5 percent of the United States egg production in 1958. This type of production will likely increase in the South and other relatively low income areas. Contract production is not likely to account for as high a percentage of total egg production at anytime in the foreseeable future as it did of 1958 broiler production.

In owner-integrated operations, the producer owns both production and marketing facilities. He may emphasize both production and marketing, or he may confine most of his activities to a well-coordinated production operation. Direct sales from producers to consumers or retailers would be included in this group. Farmer cooperatives might be included in this group, but cooperatives differ from one another and are included in the broader classifications. Emphasis in this portion of the study was limited to individual operations of 100,000 or more laying hens. Large operations of this kind were located in all sections of the country. The largest flock included in the study contained 250,000 hens.

Costs of combined production and marketing can be expected to decrease because well-coordinated production and marketing programs will result in shorter market channels. Shorter channels will decrease overhead, selling, and other transfer costs.

Quality-control on the farm lowers egg grading costs in the plant because higher quality eggs require less time to grade or mechanical equipment can be substituted for hand labor.

Increased emphasis on efficient egg production is likely to lower production costs and increase production. An increase in per capita production will likely result in a proportionately greater decrease in egg prices than the increase in per capita production.

Large owner-integrated concerns have closer control over all segments of their operations than either contract marketing and quality-control or contract production programs. Well-managed, large owner-integrated organizations can minimize overhead, selling, and other multiunit costs. A small net return per dozen eggs will result in a relatively large net return for the whole operation. Therefore, many of these organizations may develop--particularly near larger cities.

INTEGRATING EGG PRODUCTION AND MARKETING

By Ralph L. Baker 1/
agricultural economist

INTRODUCTION

New methods of handling eggs, in which production and marketing are coordinated under a single management, have spread rapidly in the last few years, and have become a subject of some controversy in agricultural marketing circles.

The study here reported was undertaken to obtain information on these new methods, to analyze the circumstances responsible for their growth, and to appraise their likely future importance in egg marketing. To this end, managers of 29 firms carrying on such coordinated programs were interviewed during the summer and fall of 1958. Seventeen of the firms--eight of them producers' cooperative marketing associations--make contracts with farm producers to supply them eggs under a supervised program of quality control. Seven of the 29 firms contract with farmers to produce eggs from flocks which the firm supplies; the firm also supervises the management of the flocks. The remaining five sample firms themselves own and operate large-scale egg-producing establishments and also market the eggs.

Integration of production with marketing of eggs is not new. Always some farmers have sold their eggs directly to retail stores or to final consumers, thus combining the functions of production and marketing. Many farmers today have profitable businesses of this sort; an appreciable part of the Nation's eggs are marketed in this direct fashion. Most of these operations, however, are relatively modest and are located within easy reach of consuming centers. Farmers' egg-marketing cooperatives have likewise been in operation for many years.

But the dominant pattern of egg marketing of the present century has been sale by producers to country-point buyers who sell in turn to other country-point buyers or to city market wholesalers. Prices arrived at through open-market trading direct the allocation of eggs through marketing channels. Quality is encouraged through price premiums based upon Federal, State, or private grades, or upon the reputation of the handler and the producers supplying him.

1/ Dr. Baker, professor of Agricultural Marketing at Pennsylvania State University, was employed by the U. S. Department of Agriculture to make this study.

As retail stores have become larger and fewer, it has become more economical to grade and carton eggs at country-points and deliver them to the stores. Many retailers also have bypassed wholesalers to obtain a more dependable supply of the desired grades of eggs. The impersonal relationship between store personnel and customers has increased the need for product standardization (fig. 1).



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Figure 1.--Eggs must satisfy the consumer.

Uniform production and handling practices result in greater uniformity in eggs than can be obtained by candling eggs which have been produced under varying conditions. Price differentials for eggs of various grades have encouraged higher quality production. Following uniformly good practices gives greater assurance of uniformly high quality in eggs. In addition to the inability of candling to separate good eggs from excellent eggs is the possibility that farm handling practices may result in quality deterioration after they have been candled. Many poultry technologists say that trying to standardize eggs produced under many conditions is like locking the stable door after the horse has been stolen. They believe that the best way to grade eggs is to know the breeding, feeding, and management practices followed by producers and market operators.

Unless open-market trading arrangements can be perfected that will permit cost savings as well as assure the quality and seasonal regularity of

production that the newer technology makes possible, it is the author's conclusion that integrated operations of the types here described promise to continue to increase in importance in the production and marketing of eggs.

CLASSIFICATION OF PROGRAMS

The many different programs being used to coordinate the production and marketing of eggs can be roughly classified into three categories: (1) Contract marketing and quality-control, (2) contract production, and (3) owner-integrated operations.

Contract Marketing and Quality-Control Programs 2/

Under the contract marketing and quality-control program, the producer agrees to market eggs under certain conditions. Practices to be followed by the producer are specified generally in writing. The buyer employs field personnel to check adherence to details. In several of these programs quality of eggs is checked by breaking out samples. The producer is generally paid a premium over prices received by nonquality-control producers.

Contract egg quality-control programs contain provisions similar to those long used in other businesses. In contracting with another firm for parts of a total assembly, the buyer specifies the materials and processes which go into the parts and their final form. The ownership of each firm is separate. The supplier generally is responsible for his own financing. The major issue is whether he wishes to supply the product according to the buyer's specifications. Similarly, in contract quality-control programs for eggs, the buyer specifies production practices and sets minimum standards for the product.

Probably the major difference between the specifications in egg quality-control contracts and in most industrial operations is the method of setting prices. Industrial contracts usually specify absolute prices whereas most contract quality-control programs for eggs specify a differential from a fluctuating base price such as a well known market report or quotation. As a result, the egg producer bears price uncertainties in addition to production cost risks.

Contract Egg Production

Contract egg production involves a contract to produce eggs for a specific firm. The producer is paid a given number of cents per dozen eggs, or

2/ The three terms "contract marketing," "contract quality-control," and "contract marketing and quality-control" are used interchangeably in this report. The longer term is the most accurate. The basic difference between these programs and marketing agreements used by some cooperatives is the provision for quality-control. Several cooperatives have added quality control provisions to their marketing agreements in recent years.

dollars per 1,000 hens per specified time, for supplying the facilities and labor of producing eggs. All eggs produced are the property of the contractor. ^{3/} Another variation is one in which the producer rents the hens from the contractor for specified amounts per dozen, depending upon prices received for the eggs. The pullets, all feed, and medications or similar items are supplied by the contractor. In most instances, quality-control requirements are similar to those of contract quality-control programs. In addition, contract production programs require specific housing and other facilities and stipulate more management details.

The contractor carries most of the price and production cost risks in contract egg production. However, he is able to reduce as well as to spread production risks by contracting with many producers. Field supervision is much closer in contract production than in most contract quality-control programs.

Owner-Integrated Operations

Owner-integrated operations are those in which the facilities for egg production as well as the birds are under one ownership and the eggs are marketed to retailers or consumers, or facilities are provided for performing the grading and cartoning operations. ^{4/} The integration of production operations or production and marketing is controlled by a single firm. Control over production and quality maintenance practices is direct. There are thousands of owner-integrated operations but nearly all are small. Consideration in this report is limited to operations of 100,000 or more laying hens.

RELATIVE IMPORTANCE OF PROGRAMS

Contract marketing and quality-control programs probably accounted for about 10 percent of all eggs sold from farms in 1958. Contract production programs may have accounted for about 5 percent of the total.

There were at least 9 owner-integrated operations of more than 100,000 hens each in the United States in 1958. The largest included in the study contained 250,000 hens. These 9 flocks produced less than 0.5 percent of the Nation's table egg requirements in 1958. However, as an indication of the size of a 250,000 hen flock, approximately 1,000 flocks of this size would

^{3/} The term "contractor" is used to refer to the program developer and operator who owns the hens. The term "producer" is used to refer to the person on whose farm the eggs are produced.

^{4/} The term "owner-integrated" is used in a special sense because, technically, if more than one process in the production and marketing of eggs is performed under the same management, the operation is vertically integrated. Thus, nearly all--if not all--egg production and marketing in the United States is vertically integrated to some degree. Technically, egg marketing cooperatives would also be considered owner-integrated since the marketing facilities are owned jointly by egg producers. The term here refers to an individual firm.

produce the Nation's total table egg requirements at the 1958 rate of consumption.

DESCRIPTION OF CONTRACT EGG MARKETING AND QUALITY-CONTROL PROGRAMS

Seventeen plants with contract quality-control programs were included in this study. These were located in the Northeast, Southeast, Midwest, and on the West Coast. Nine of the organizations were independently owned and eight were cooperatives. The volume of eggs handled by each of the several firms ranged from less than 1,000 to more than 30,000 cases per week.

The first contract quality-control programs for eggs, among those studied, were started by cooperatives on the West Coast shortly before World War II. The basic provision of one program concerned farm oiling of eggs to retain quality by preventing the escape of carbon dioxide. Because of price problems growing out of the War, the program was discontinued after about 2 years. A broader quality-control program was developed after the War and with several revisions was operating in 1958. Another early 1940 program which provided premiums for nest clean eggs had added other quality-control provisions and was also still in operation in 1958.

Other programs were started on the West Coast in the late 1940's and early 1950's. In 1955, a large food chain began buying eggs from producers in Iowa and Minnesota on a contract quality-control basis. In 1957 and 1958, programs with similar quality-control features were started in about every section of the country.

Reasons for Starting Quality-Control Programs

Specific reasons given for starting quality-control programs all have an economic foundation. They started either from specific problems of the marketing firm or the desire on the part of raw material suppliers (either feed or chicks) to sell their products to producers.

The west coast cooperative which started the farm oiling program in 1940 had been buying eggs on a grade basis and had an extensive producer educational program. The primary goal was to obtain an even seasonal distribution of high quality eggs. The noncontract program had not yielded the desired results. Therefore, in 1952, a contract program was developed which paid producers a premium of 2 cents a dozen for adherence to a contract requiring: (1) A strain of birds which laid either white or brown eggs (no tints) with a low percentage of blood spots, (2) a maximum of 14 months production from pullets, (3) a prescribed feeding program, (4) dry-cleaning of any dirty eggs, (5) mechanically refrigerated egg rooms, and (6) generally good management practices. Egg quality was determined by measuring a small sample of broken-out eggs. Minimum requirements for broken-out eggs were not specified in the contract but were used as a basis for quality improvement and rejection of the eggs for the program by the sales manager.

Each producer in the program was asked to indicate in the agreement the number of dozens of eggs he expected to deliver each month during the succeeding 12-month period. If the quantity delivered did not vary from season to season, he was paid an additional premium of 1 cent per dozen.

Many other programs have been patterned on the plan used by this west coast cooperative. Leaders in this development all gave reasons for starting programs which dealt with quality improvement, cost lowering, or increasing feed or chick sales. In addition, some of the early adopters of the new programs indicated that they wanted better eggs so that they could pay higher prices and compete with the procurement programs of others.

Methods of Quality-Control

Specified details in the quality-control requirements varied with the situation under which each program operated and the ideas of the operators on how to obtain the desired level of quality. Since most of the programs were new, many operators developed detailed provisions as the programs grew. Some operators believed that producers might seek other outlets if the contract provisions were too stringent. The programs which had been operating longest generally had the most stringent quality-control provisions.

Usual production practices varied considerably among areas. Therefore, it was necessary to include specific provisions in some areas while in other areas it was taken for granted that such practices would be followed.

There was general agreement on the necessity for cool egg rooms on farms or fast movement of eggs from farms to marketing firms. There was also general agreement that a strain of layers which produced eggs with sound shells, good albumen quality, and few bloodspots should be used. Most operators agreed that feeding programs should result in a standardized yolk color. But the specific provisions concerning strain of layer and feed used varied widely and were partly dependent on whether the operator sold feed or chicks.

All program operators wanted clean eggs to sell but there were differences in opinion on the best way to clean eggs. This resulted partly from differences in the number of days between production of the eggs and their sale in retail stores. Differences among the recommendations of technologists were also a factor.

Refrigeration 5/--Thirteen of the 17 contract quality-control programs required mechanical refrigeration on farms. The four remaining plants encouraged the use of mechanical refrigeration and had arrangements for selling cooling equipment to farmers. Two of these four plants recommended a maximum egg room temperature of 60° F. and a third required either refrigeration or daily delivery of eggs to the plant.

The most common temperature recommendations were 55° to 60° F. Few plants recommended temperatures below 55° F. because of the greater probability

5/ See Appendix pages 44 and 46 for sales of coolers for egg rooms by regions.

of eggs held at lower temperatures sweating during grading in the plant. Temperatures above 60° F. were not recommended because of quality deterioration problems. One plant required route drivers to record the egg room temperature and relative humidity on each producer's route slip at the time the eggs were picked up.

The recommended relative humidity for farm egg rooms was generally either 70 or 80 percent.

Seven of the 17 plants had air-conditioned egg grading rooms both for the comfort of their employees and to prevent sweating of eggs. Eggs were held under refrigeration in all plants.

Breeds and strains of laying hens.--Eight contract quality-control programs required white egg breeds. Six suggested specific strains of layers. In three instances the hens were all of the same strain. Nearly all of the hens included in the contract quality-control programs laid either white or tinted eggs. Several plants kept records of yields of eggs of various grades as well as broken-out egg scores from different strains of hens.

Maximum age of layers.--Because egg quality generally declines as hens grow older, most programs had some means to control the age of hens which were included in the program. Specific requirements on maximum age of layers or number of months of egg production were included in 12 programs. Two other programs recommended only pullet layers. Another required a yield of at least 80 percent Grade A eggs. This usually eliminated producers who did not keep only pullet layers. Of those with specific requirements for age of layers, 11 permitted a maximum of 12 to 14 months of egg production and 1 permitted 15 months.

Feeding requirements.--The brand of feed manufactured by the egg buyer was required in 6 of the 17 programs. Another program operator strongly recommended that producers buy the feed sold by a feed manufacturer who had assisted in developing the contract quality-control program. In all other instances, any well balanced feed which produced relatively light colored yolks could be used.

Confinement of layers.--Most of the contract quality-control programs in the Midwest contained provisions that layers be confined. In other areas, program operators indicated that this requirement was not necessary because confinement was a prevailing practice among producers.

Gathering eggs.--Most programs required that the eggs be gathered at least three times a day. Several programs specified the hours of the day at which eggs should be gathered. Some plant managers reported that although their specifications called for three gatherings a day, many producers were gathering eggs more often to reduce the number of dirty eggs.

Vaccination for respiratory diseases.--Since respiratory diseases cause losses in egg quality, vaccination for bronchitis and Newcastle was required by the major contract quality-control program and one other program in the Midwest. One of the two southeastern contract quality-control programs also

required vaccination for these diseases. The northeastern programs did not require vaccination. West coast operators indicated that they did not require vaccination for respiratory diseases because their producers were already following this practice.

All programs, except two, required delivery of clean eggs, but the requirements for cleaning varied widely. This variability undoubtedly stemmed from the lack of agreement of the effects of different cleaning methods on egg quality.

Most plants required producers to clean eggs immediately after gathering. In the Midwest, most programs did not permit washing but required dry cleaning of stained and dirty eggs. In general, in those programs permitting farm washing of eggs, the program operators specified the kind of washing equipment, techniques, and sanitizer-detergent to be used. That is, all operators requiring or permitting eggs to be washed were trying to see that it was done properly.

Because cleaning provisions of the contracts were difficult to enforce, two plants established inplant washing facilities. One large west coast co-operative combined washing and grading operations with their quality-control program. All producers followed a strict quality-control program, including oil processing of the eggs on the farm. In the plant: The eggs were vacuum lifted from the filler-flats, placed on a conveyor, washed in a water and sand mixture at 140° F., rinsed at 180° F.; extremely large, misshaped and checked eggs removed by flash candling 6/, a sample of eggs taken for determination of grade by breakout, bloodspot eggs removed electronically, and the eggs weighed and packaged automatically.

The machine used for this operation was a joint development of the plant and an equipment company. The plant reported that use of this machine reduced costs of grading and cartoning eggs even though the cost of the cleaning service was included.

Oil-treating eggs on the farm.--Oil treatment to preserve interior egg quality by slowing down the escape of carbon dioxide was included in the major contract quality-control programs in the Midwest. Oil was sprayed on the eggs immediately after they were cleaned. They were not completely covered with oil. This permitted some carbon dioxide to escape so that the eggs would peel easier if they were hard-cooked. The programs on the West Coast also generally included oil treatment on the farm. One plant's program provided that the eggs be oiled the day after being laid to permit some of the carbon dioxide to escape. Another plant which recommended oil treatment immediately after gathering indicated that no complaints had been received from buyers.

Grading and packing eggs.--Size-grading of eggs by producers was required for contract quality-control programs in the Northeast and by some plants on the West Coast. Midwestern plants did not require this. One southeastern

6/ Flash candling, as used here, means looking at several eggs at a time as they pass over a light.

plant required all producers to size-grade on a specific machine and the other did the size-grading in the plant.

Most contract quality-control programs required casing of the eggs in precooled cases 12 to 15 hours after they were laid. Most plants took for granted that producers would case eggs little end down and did not include this practice in their specifications. Three plants required separate packing of odd-shaped, roughshelled, or tinted eggs. Two programs required packing of eggs from different aged flocks separately.

Delivery practices.--Most eggs on contract quality-control programs were picked up at the farm by the buyer. There were three major exceptions to this practice. One midwestern plant received nearly all of its eggs from within a 10-mile radius. Producers delivered eggs to the plant a minimum of two times each week. Eggs sold through the largest contract quality-control program in the Midwest (operated by a retail food chain) were either delivered to a set-in station ^{7/} or picked up at the farm by set-in station operators. One southeastern organization required producers to deliver eggs twice a week if they had refrigerated egg rooms and daily if they did not.

The usual pickup schedule was twice each week for all but three of the plants providing farm route services. The three exceptions picked up eggs once each week.

Miscellaneous quality-control provisions.--Several programs provided that the laying house and equipment be maintained in sanitary condition.

A few programs contained specific provisions barring fertile eggs. In some instances, infertile eggs were required except during hatching season. In others, all eggs must be infertile.

One program required that a specific person on the farm be responsible for seeing that provisions of the quality-control program were followed.

General Provisions of Contract Marketing and Quality-Control Programs

Flock sizes.--Contract quality-control producers in the Midwest generally had smaller flocks than those in other areas. Producers on quality-control programs also had larger flocks than nonprogram producers selling to the same plants (table 1). A preference for a minimum flock of 500 hens was generally indicated in the midwestern programs. One program in the Northeast had a general minimum requirement of 1,000 hens. Another northeastern program required a minimum of 3,000 hens. The west coast programs did not specify minimum numbers of hens but most of them included only relatively large flocks. One west coast organization's farm route drivers did not stop for less than five cases a week. Most firms with quality-control contracts accepted only full cases of eggs from producers.

^{7/} A set-in station was usually a hatchery or feed dealer providing a cooler for holding the eggs until they were picked up.

Some programs encouraged development of larger flocks by paying volume premiums ranging up to 3 cents a dozen. The differentials reflected, in part, cost savings in handling eggs from larger flocks. Equally important, however, was the use of volume differentials as a competitive device.

Table 1.--Approximate average weekly sales of eggs per producer for program and nonprogram producers, 17 sample plants, 1958 1/

Area	Cases of eggs sold by	
	Program producers	Nonprogram producers
	<u>Number</u>	<u>Number</u>
Northeast.....	40	8
Midwest.....	10	4
Southeast.....	30	<u>1/</u>
West Coast.....	60	20

1/ Producers were all on quality-control programs in sample plants.

Sale of eggs to other buyers.--Most contract quality-control program buyers required sale to them of all eggs except those used for home consumption or sold to hatcheries. Two programs provided that all eggs produced be sold to the organization. Another permitted sales of eggs to individual consumers at retail prices on the farm where produced. Another deviation from the normal pattern was the requirement that at least 95 percent of the eggs produced each month be sold to the plant. Another permitted the sale of pee-wee, small, and cracked eggs to other outlets.

Duration and renewal of contracts.--Most independent organizations did not require signed agreements. There was merely an oral agreement to follow the practices specified in the printed instructions furnished by the buyer. Most cooperatives having quality-control programs required signed marketing agreements.

Most written agreements were for a period of one year with automatic renewal, provided neither party gave notice in writing of intention to terminate the contract. A minimum of 30 days' notice generally was required.

Most contracts provided for automatic termination if production practices or the eggs did not meet contract specifications. In most instances, the automatic termination simply meant that the producer would not receive the premium price for eggs.

Financing Producer Operations on Contract Quality-Control Programs

Buyers did little financing of producers who were on quality-control contracts. Most plants had provisions for financing egg-room coolers, but few producers availed themselves of this aid.

Most firms selling feed gave short time credit to producers. Payment for feed was generally required at the succeeding delivery or within 30 days. A few firms financed the feed for growing pullet replacements. Payments for feed supplied for growing pullets were scheduled in accordance with the expected rate of lay of the pullets.

In one program in the Southeast, some producers had a feed financing program with a feed company other than the contracting firm. In another southeastern program, the contracting firms grew the pullets and permitted producers to pay for them during the egg production period.

Farm Inspection Policies of Contract Quality-Control Programs

All contract quality-control programs had some means of farm inspection. Fieldmen usually performed the multiple role of salesman for the program, adviser to the producer on production problems, and inspector for adherence to program specifications. In the newest programs, the field personnel were spending much of their time selling the program to farmers.

The largest contract quality-control program in the Midwest had a joint inspection program with set-in station operators. Several of the smaller programs in the Midwest used their farm route men to check farm operations. One plant paid route drivers a bonus based on the yield of Grade A eggs on each farm route. A general farm organization provided the fieldman for one midwestern program.

A contract quality-control program in the Southeast was the only one in which specialized field personnel visited producers at least once each week. In most other programs, visits to cooperating farms were either to assist the producer with some production problem or to correct some quality-control problem. In other words, there was a tendency for farm visits to be of a remedial rather than a preventive nature.

Price Determination for Contract Quality-Control Programs

Prices paid producers by independent operators of contract quality-control programs were generally based on a specific quotation. Cooperative organizations generally paid premiums above regular pool prices.

In the Northeast, one contract quality-control program buyer paid a net price to producers of either 2 or 2-1/2 cents a dozen, depending on the number of dozens delivered, over the New York Uner-Barry Extra Fancy Heavy-Weight White Egg quotation for AA and A large eggs if the yield of AA eggs was 60 percent or more. The paying price for eggs yielding 30 to 59.9 percent AA eggs was 1 cent a dozen less than for those yielding 60 percent or more AA eggs. Direct comparisons between prices to program and nonprogram producers cannot be made because only program eggs were included in AA packs. A cooperative organization paid 1 cent a dozen more to contract producers than to other producers with the same grades of eggs.

In the Midwest, producers were generally paid a net price for Grade A large eggs of either 4 or 5 cents under the New York Urner-Barry Midwest Fancy Heavy-Weight Mixed Color quotation. Two midwestern cooperative organizations guaranteed no specific differential. Premiums were based on added returns from the sale of the program eggs. Another midwestern cooperative guaranteed quality-control producers a minimum of 1 cent a dozen premium plus any additional amount realized from the sale of the eggs. Independent organizations in the Midwest indicated that program producers received about 3 cents more per dozen for Grade A large eggs than nonprogram producers received for the same grade.

The southeastern programs included only quality-control producers and, therefore, premiums were not paid as such. One organization was a cooperative and the other did not pay producers on a specific quotation basis.

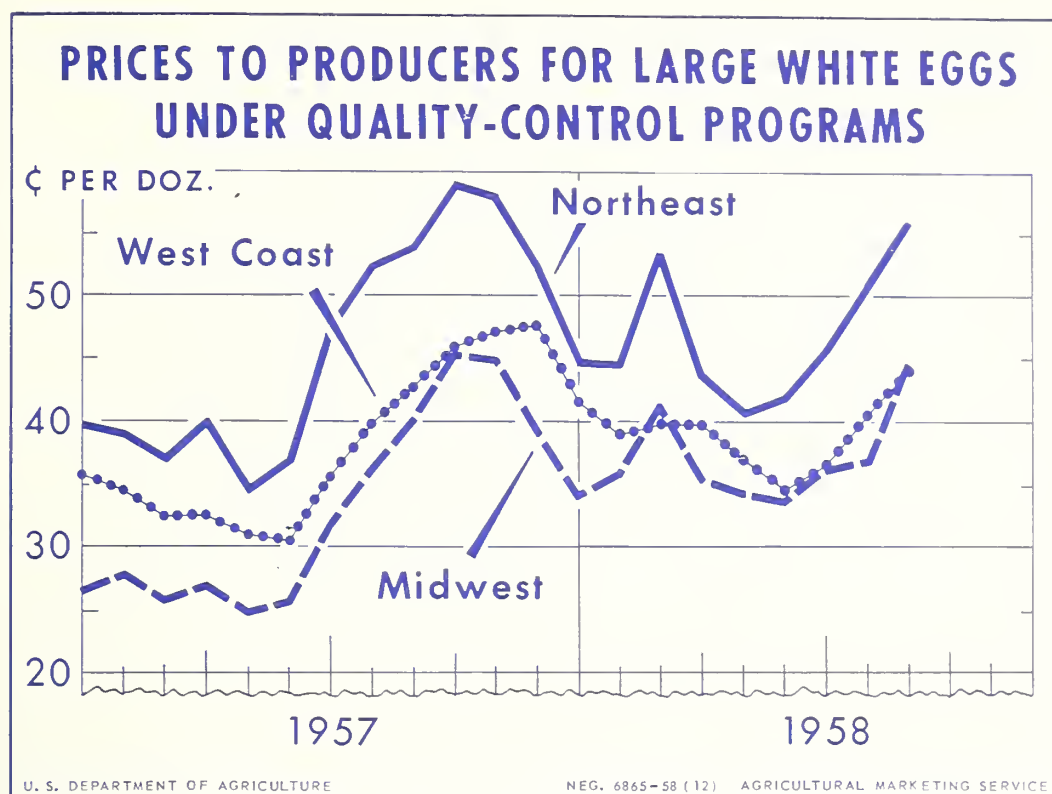
On the West Coast, prices for quality-control eggs were tied closely to U. S. Department of Agriculture reports of prices to retailers. One west coast cooperative paid producers a premium of 2 cents a dozen for following quality-control practices plus an additional 1 cent for relatively even seasonal distribution of production. The latter premium was discontinued in 1958. In the same year, an additional program was inaugurated which included inplant washing and no premium payment. The plant reported that producers were eager to transfer to the new program although it meant giving up the 2-cent premium. Another west coast cooperative started a new quality-control program in 1958, in which the incentives to producers were the prestige value of being a premium quality producer and the prospect of receiving a higher price once the sales program for the eggs was well developed. Another cooperative paid a premium of 2 cents a dozen on large eggs and 1 cent a dozen on medium eggs if the producer followed program details, including delivery of clean eggs.

Figure 2 shows that northeastern producers on quality-control programs received considerably higher prices than producers in the Midwest or on the West Coast. The midwestern-northeastern difference appears to be considerably greater than the cost of transferring eggs from the surplus Midwest to the deficit Northeast.

In the Midwest, producers usually needed a yield of either 75 or 80 percent Grade A eggs to qualify for price premiums. One firm required a yield of 90 percent Grade A eggs. Break-out tests were used by the largest midwestern program.

Most west coast programs used broken-out egg samples. To qualify for programs, a flock average of 72 to 76 Haugh units generally was required but qualified producers usually were not dropped from the quality-control program

until their flock average was down to about 70 Haugh units 8/. One plant required a cumulative average of 72 Haugh units to remain in the program.



Effects of Contract Quality-Control Programs

Many of the contract quality-control programs were so new that their effects on grade yields of eggs, seasonal distribution of production, flock sizes of producers already in production, development of new production, plant volumes, plant costs, and sales outlets could not be measured. Some, however, had been operating long enough to measure these effects.

Grade yields of eggs.--One of the immediate effects of these programs was on the quality of eggs received by the plants. This effect was of a dual nature: (1) Yields of top grades of eggs were increased, and (2) the quality of eggs within the top grades was improved. Several buyers pointed out that

8/ The Haugh unit is a measure of the height of thick white in relation to the weight of the egg. The requirements of 72 to 76 Haugh units would equal an egg of high Grade A quality. For further discussion of interior egg quality measurement, see Kilpatrick, Lester; Brant, A. W.; and Shrader, H. L., "Equipment and Methods for Measuring Egg Quality," AMS-246, U. S. Dept. Agr., June 1958.

improving the quality of eggs within the top grades was at least as important as raising yields.

In one northeastern program, the proportion of eggs of Grade A or better from program producers ranged from 85 to 95 percent. This was 20 to 25 percent higher than the yield from other flocks selling to the same buyers. Most midwestern plants reported a year-round average yield from their quality-control flocks of around 80 percent Grade A or better eggs. This also was 20 to 25 percent higher than the yield of other flocks during the late spring and summer months. However, it was only 5 to 10 percent better than other flocks during the late fall and the winter months. Operators of two midwestern plants who were starting contract quality programs reported plant average yields based on Federal-State supervised grading of more than 80 percent Grade A eggs. They were starting the programs to raise the level of quality within the top grade. One midwestern plant which had been on a quality-control program for about 3 years had increased its total plant percentage of Grade A eggs from about 50 to about 85.

The two southeastern firms with contract quality-control programs handled eggs only from program producers. Since they were basically removing only bloodspotted, cracked, and misshapen eggs, their yields of top grade eggs averaged above 90 percent of total receipts. On the West Coast, the grading on quality-control programs was also largely a matter of removing eggs with defects rather than trying to separate them into quality grade categories. Yields of the top grades were generally around 90 percent.

Seasonal distribution of production.--Plant managers in most areas indicated that uneven seasonal distribution of sizes and quantities of eggs was still a problem. Most west coast operators reported, however, that seasonal distribution of production was no longer a problem.

One west coast plant reported the proportion of large eggs in 1957 ranged from 66 percent in August to 77 percent in February. Percentages of medium eggs ranged from about 20 in February to 26 in July. The range in proportion of small eggs was from 3 percent in February to 8 percent in July. Another west coast plant reported almost identical figures. In contrast, one northeastern organization reported that in October large eggs accounted for 46 percent of its volume. In April, 76 percent of its total volume was in these grades. The percentages of medium eggs ranged from 12 percent in April to 33 percent in November.

Data were not obtained on seasonal distribution of sizes of eggs in the Midwest. However, it is obvious from the distribution of hatching of egg-type chicks that nearly all of that region's small and medium eggs were marketed in the fall months. In 1956 and 1957, only 3.2 percent of the egg-type chicks in the West North Central States were hatched during the last 6 months of the year. In the East North Central States, about 7 percent of the egg-type chicks were hatched in the last half of the year. In contrast, approximately 40 percent of the egg-type chicks were hatched during the same period in the Pacific States. Proportions of egg-type chicks hatched during these months in other regions of the country were between the West North Central and Pacific Coast extremes shown in figure 3.

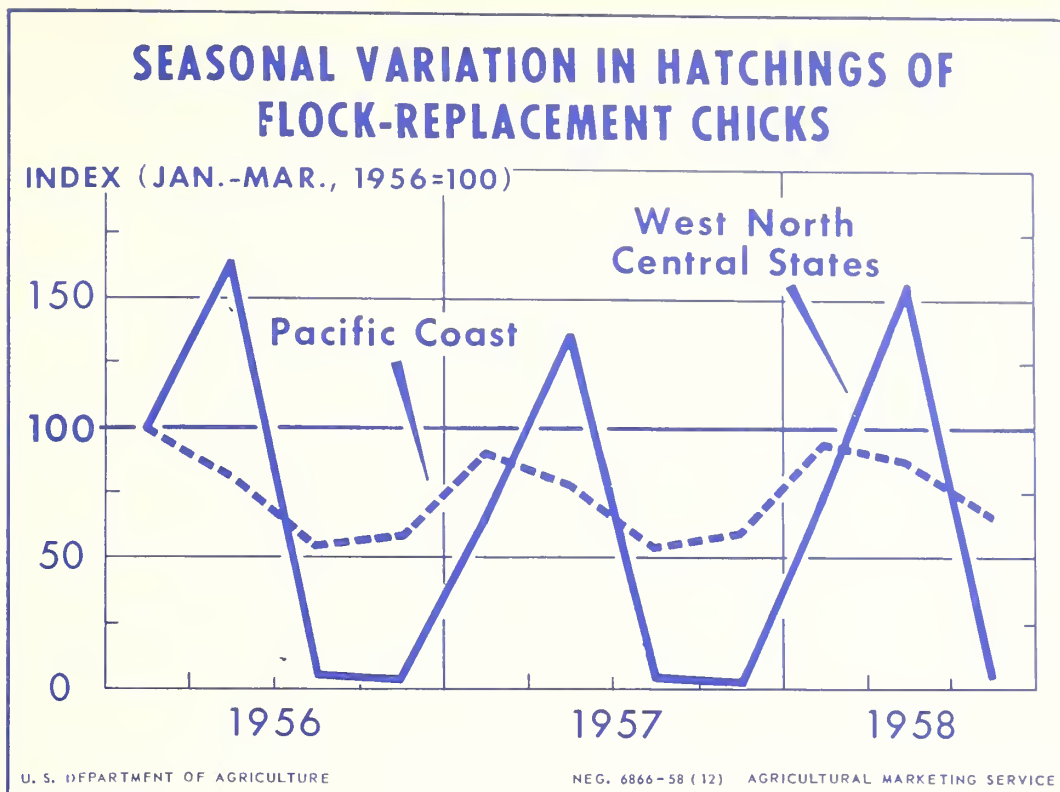


Figure 3

Several program operators were attempting to overcome the seasonal distribution of production problem by requiring of each producer a minimum of two equally spaced flocks a year. In a few instances operators attempted to control seasonal distribution of production by having producers replace their entire flocks at different times of the year.

Flock sizes of existing producers.--Plant operators with quality-control programs in effect for some time believed that the programs had resulted in larger flock sizes. The west coast cooperative which has been a leader in developing quality-control programs reported that average receipts per producer in 1958 were eight times those of 1952. The plant was not able to add new producers to the quality-control program because the original group of producers increased production as fast as new outlets were developed. Average deliveries at one midwestern plant had more than doubled in 3 years. Other programs had not been in effect long enough to measure flock size increases.

Midwestern operators generally advised their producers not to increase flock sizes if this required the hiring of labor.

Bringing new producers into production.--In all areas except the Southeast, most program producers had been in the egg business before the programs were started. The two contract quality-control programs in the Southeast involved new egg producers. In one case the new producers formed a cooperative to market their eggs. The other program was developed by a feed company which also marketed the eggs.

Plant volumes.--Most plant operators reported that their total volume of eggs had increased since the contract quality-control program had started. The west coast cooperative, which started on a contract quality-control program in 1952, had egg receipts in 1958 of more than four times those of 1952. Set-in stations for the food-chain program in the Midwest reported increases of 100 to 300 percent in 3 years. The major exceptions to the pattern of increases were midwestern plants which started contract quality-control programs largely as a defensive measure. These plants generally reported that the programs enabled them to retain their previous volumes.

Plant costs.--Most plants reported that costs of handling contract quality-control eggs were lower than those for noncontrol flocks. Costs were lowered by decreased costs of grading. These lowered costs stemmed from (1) lowered cost of candling because candlers could grade more cases an hour of the higher quality eggs, or (2) the use of flash candling systems and electronic equipment to remove defective eggs in the quality-control programs. Procurement costs were lower for the contract quality-control flocks because of the larger size flocks. Program operators generally reported that field supervision added little to total costs because in most instances the change to a contract quality-control program resulted in a realignment of duties of current personnel. One of the newly established southeastern programs was closely supervised. The manager reported that field supervision costs were approximately one-half cent a dozen.

Market outlets.--Except for one southeastern and two midwestern organizations, all contract quality-control operators were cartoning eggs. Eggs from set-in stations for the largest midwestern program were cartoned either at major distribution centers or at a country-point plant, or were sold to other buyers by the food chain. Other contract program operators cartoned most of their quality-control eggs for retailers. Northeastern and west coast operators generally sold these eggs as AA grade. Midwestern and southeastern plants sold their top quality eggs as Grade A. In many instances the contract quality-control program enabled plants to obtain outlets that otherwise would not have been available to them. In a few instances, eggs from quality-control flocks were being packed with noncontrol eggs and sold at similar prices.

Buyers in all sections of the country indicated that it was difficult to get producers to accept the quality-control program when it was initiated. After the programs were started, the problem quickly became one of keeping the quantity of eggs down to market demands for them. This was particularly true in the Midwest where several buyers indicated that many regular producers wanted to participate in the contract quality-control program, but they could not be accepted until additional premium outlets were obtained. The smaller midwestern operators often found it difficult to obtain and service outlets for quality-control eggs in major distribution centers.

DESCRIPTION OF CONTRACT PRODUCTION PROGRAMS

Seven contract production programs were included in the study. All were independent firms located in the Southeast. Only one was in the market-egg

business prior to the beginning of the contract program. The first program in the area was started by an egg and poultry marketing firm in the early 1950's. The remaining programs were started from 1955 to 1958. Two of the program operators were feed manufacturers. Two were feed dealers. One program was a joint venture of a hatchery operator and a feed manufacturer and one was developed by local businessmen specifically to produce and market eggs.

All were selling most of their eggs in nearby markets but only 4 of the 7 were cartoning eggs in 1958. Approximately 800,000 hens were in the 7 contract production programs in 1958. The numbers of hens in the several programs ranged from 50,000 to 200,000.

Reasons for Starting Contract Production Programs

The marketing firm started its program chiefly to assure itself of a dependable source of high quality eggs. The businessmen started theirs because they believed that they could obtain a good return on their investment by supplying local markets with high quality eggs at reasonable prices and at the same time raise incomes of producers in the area. The other programs were started largely to increase sales of feed or chicks. One operator believed that because of low housing costs, availability of labor and favorable feed prices, eggs could be produced at a lower cost in his region than in any other section of the country. Decreased cotton acreage allotment was given by some producers as a major reason for entering a program.

Obtaining outlets for the early programs was apparently not difficult since the area was deficit in egg production and many retailers wanted high quality eggs.

Methods of Quality-Control

Refrigeration.--Five of the seven programs required mechanical refrigeration. In most instances egg rooms were built in laying houses. Temperature and humidity requirements were similar to those of contract quality-control programs. One firm not requiring refrigeration picked up eggs daily. Production for this program was concentrated in a small area. In the other program without refrigeration, eggs were picked up twice weekly.

Breeds and strains of laying hens.--White egg breeds were used in all of the contract production programs. A single strain was used in five programs. Strains from three of the Nation's leading breeders were used by one. The remaining operator bought started pullets from several pullet growers but was not satisfied with the quality of some of the birds.

Maximum age of layers.--Some of the programs which started in 1958 had not set a limit on age of layers. Those with definite provisions kept layers for 12 to 14 months of lay.

Feeding requirements.--Feeding practices within each contract production group were highly standardized. Only one brand of feed was fed in each. Four programs used nationally advertised brands of feed but three manufactured their own feed.

Other management practices.--Contract production programs generally had specific management requirements. Provisions were included concerning cleanliness of waterers, nest and floor materials. No other poultry was permitted on most farms. Management practices were supervised closely by fieldmen.

Most programs required frequent gathering of eggs in either wire baskets or filler-flats in wire frames. Two required sorting out dirty eggs at the time of gathering.

Cleaning eggs.--All seven contract production programs required cleaning of eggs on farms. Eggs were mostly dry-cleaned in three programs and washed in sanitizer-detergents in the others. Most programs included detailed instructions for cleaning eggs. In two programs the owners furnished the sanitizer-detergent to remove any inclination to use less than the recommended amount.

Oil-treating eggs on the farm.--None of the contract production programs included provisions for oil-treating eggs on farms.

Grading and packing eggs.--Eggs were size-graded at the plants in five programs. One required size-grading by producers on a specific machine. Another paid producers an additional 1-1/2 cents a dozen for hand-sizing eggs.

All programs required that eggs be cased after they were cool--usually the day after they were laid. If the buyer inadvertently left at the farm a case which was dirty or contained dirty packing material, it was not to be used. Some programs required eggs with weak shells to be packed in separate cases.

Delivery practices.--Eggs were picked up at the farm in five of the programs. The number of pickups ranged from once a week to once a day. Two plants required twice weekly deliveries by producers.

Seasonal Distribution of Production

The seasonal pattern of egg production was largely controlled by the times at which the chicks or pullets were placed with producers. Few caged layers were used. The general policy was to replace a complete flock at a time and seasonal distribution of production was controlled by replacing flocks at different times of the year.

The goal in one program was to replace 1/52 of the birds each week. In another program the owner tried to place birds so that all flocks would reach peak production of large eggs in the early fall.

The time of replacement was usually closely associated with the time at which the producer received his first chicks or pullets. In some instances, relatively large numbers of pullets were originally placed during the last 6 months of the year. This created problems in placing later flocks to obtain an even seasonal distribution of various sizes of eggs.

Operators selling principally to retailers made more effort to obtain an even seasonal distribution of production of eggs than those selling mainly to wholesalers. This was apparently an indication of a better understanding of retailers' problems by those who dealt directly with retailers.

General Provisions of Contract Production Programs

Flock sizes.--The contract production programs contained flocks of 600 to 10,000 or more hens. Most flocks were in the 2,000 to 4,000 bird range. Average sizes of flocks per plant ranged from 2,500 to 3,000 hens.

In one program, each producer had either 2,000 or 4,000 hens. No other flock sizes were permitted. Another program generally included flocks of either 2,400 or 4,000 birds. Most flocks in a third program contained either 2,000 or 3,000 hens.

The relatively narrow ranges in flock sizes of most of the contract production programs stemmed from (1) the desire of program operators to spread risks, (2) the amount of financing needed by producers to construct and equip laying houses, and (3) the need for large enough units to lower inspection and procurement costs and to make an important contribution to the producer's income.

Housing provisions.--Some of the contract production programs contained detailed specifications for houses. In other cases, the requirements were of a general nature but fieldmen assisted in developing house plans. Provisions were generally included for the amount of floor, feeder, waterer, nest, and roost space per bird.

Most houses were built of native lumber (fig. 4). Costs for houses and equipment, not including the producer's labor, ranged from about \$1.25 to \$2.00 per bird. These costs did not include automatic feeders or droppings cleaners since few producers had installed such equipment.

Duration and renewal of contracts.--Most agreements ran for the laying period of the specific flock of pullets placed with the producer. All provided that the contractor could discontinue the arrangement at any time. A few flocks had been removed for poor management. The usual policy was first to warn the producer and then, if the poor practices were not corrected, the flock was removed. In other instances, agreements were not renewed for the succeeding year because the producer's efficiency was below average.

Program operators tried to reduce the need for removing flocks by care in selection of producers. Most programs required that the producer and his family provide all the labor. The operators generally tried to select

producers who were honest, who would accept supervision, and who strongly desired the increased income from the program.



BN-7621

Figure 4.--A low-cost house of the type used by contract producers.
Bulk feed is being unloaded from the truck.

Financing Producer Operations on Contract Production Programs

Out-of-pocket costs to producers in the contract production programs involved payment for houses, equipment, litter, nesting materials, and electricity. In two cases, producers also furnished fuel for brooding chicks.

Producers had the responsibility to obtain the necessary financing to participate in the programs. Most of the needed funds were obtained from local banks or other local agencies. Program personnel usually assisted producers in making contacts with lending agencies but a loan was generally a direct arrangement between a producer and a lending agency.

Farm Inspection Policies of Contract Production Programs

All contract production programs had fieldmen whose specific tasks were (1) to assist producers to obtain efficient production, and (2) to see that quality-control provisions were followed. Visits were made to each farm at least once, and generally more frequently, each week in all programs. In most instances, fieldmen worked closely with each producer and tried to prevent serious production problems. Nevertheless, operators reported relatively wide variations in costs and returns among individual producers.

Payment to Producers in Contract Production Programs

Each program differed from the others in producer payment details. One paid producers \$150 for the first month, and \$200 a month thereafter for each unit of 2,000 hens. The remaining six programs paid producers on the number of eggs produced. Base payments for clean, sound-shell eggs ranged from 5 to about 7-1/2 cents a dozen. Five included incentive payments for efficient production and the sixth was developing an incentive plan in 1958. ^{9/} In addition, most of the programs permitted producers to consume some of the cracked eggs. The manure also belonged to the producer.

Effects of Contract Production Programs

Since only one of the operators had been in the egg marketing business before the contract egg production programs were started, comparisons like many of those for the contract marketing and quality-control programs cannot be made.

Most eggs produced under these programs were sold to southeastern buyers who had been purchasing most of their eggs from midwestern sources. The one firm which had been in the egg marketing business for many years obtained most of its eggs from the Midwest in 1953. By 1958, most of its eggs were obtained from its own and similar programs in the Southeast.

Grade yields of eggs.--The quality-control provisions and close field supervision of the contract production programs resulted in yields from 85 to more than 90 percent top quality eggs in most of the programs. None of these operators was using broken-out measurements for interior egg quality.

Bringing new producers into production.--Few producers in the contract egg production programs had been in commercial egg production prior to participating in the programs. Most producers built and equipped laying houses to participate in the programs. In the 7 programs studied, most of the more than 300 producers with approximately 800,000 hens had started commercial egg production since 1955. Many other similar programs have started in the South in recent years.

^{9/} See Appendix for details of individual contract production programs.

DESCRIPTION OF OWNER-INTEGRATED OPERATIONS

An important part of the Nation's total egg production is marketed directly by farmers to retailers or consumers. In the Southeast, direct delivery of cartoned eggs to retail stores by producers accounted for a relatively large percentage of farm egg sales in 1958. Most producers using this type of program kept from 2,000 to 20,000 hens. However, several producers in the Southeast with larger flocks, including one with 150,000 hens and another with 175,000 hens, were selling eggs directly to retail stores.

The policy of a leading retail food chain in the Southeast was to purchase all eggs on a cartoned, store-door delivery basis within the State in which the stores were located. Both the chain's and individual producer's brands were carried in stores.

A leading midwestern retail food chain purchased all of its eggs from producers who cartoned the eggs on their farms and delivered them directly to individual stores.

In the Northeast, sales of eggs direct to consumers on retail routes was an important part of total producer sales.

Emphasis in this portion of this report, however, is placed on operations of 100,000 or more hens (fig. 5). Of the five operations used as examples, two were located in the Northeast, and one each in the Midwest, Southeast, and on the West Coast. From 100,000 to 250,000 hens were included in each operation.

Individual Operations

Each operation differed from the others. Operation I was a corporation formed by a hatchery operator and a local feed manufacturer. It included 100,000 hens at 16 locations in 1958.

Several of the farms were obtained from producers who started in the egg production business shortly after World War II. Most of these farms were acquired when the former producers ran into financial difficulties.

Two white egg producing strains were used in 1958. All hens were on the same feeding program. Eggs were gathered twice each day in plastic filler-flats, taken to the central farm, washed immediately in a sanitizer-detergent without being removed from the filler-flats, and placed in a refrigerator to cool. Most of the eggs were graded and cartoned the following day in an air-conditioned room. Average yields of Grade A or better eggs exceeded 90 per cent.

All eggs were sold through a broker. Cartoned eggs were delivered direct to independent supermarkets and to the warehouse of a chainstore. Uncartoned eggs were delivered to nearby egg dealers.



BN-7888



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Figure 5.--Large owner-integrated operations. Above, a plant in North Carolina. Below, roofs of 10 poultry houses of a plant in California. Feed mill and grading plant show in the rear.

Prices for all eggs were based on the New York Urner-Barry Extra Fancy Heavy-Weight White egg quotation.

Operation II was a corporation formed by a nonagricultural businessman to produce market eggs. The operation was started because it was believed that a good return could be made on the investment through economies of large scale production and price premiums resulting from high quality eggs.

This operation had facilities for 150,000 laying hens on two farms. Chicks were grown on a third farm. Five white egg strains of layers were used in 1958. All were purchased from major breeders. Records of broken-out quality and production of eggs from each strain were maintained.

Feed was purchased from five firms in 1958. Three of the feeds were national brands and two were locally produced. The manager believed that similar qualities of feed could be produced by the organization at a lower cost.

Eggs were gathered twice daily in plastic filler-flats, washed immediately in a sanitizer-detergent in the filler-flats, taken to a cooler and graded the following day. A flash candler was used for grading most eggs.

Yields of Grade A or better eggs were generally above 90 percent except from houses of second-year layers. The practice of keeping second-year layers was being discontinued. Plans were to keep pullets for 11 months of egg production.

Eggs were sold through a broker. Most eggs were cartoned in the top grade carton of a retail chain. The producer was responsible for supplying stores of the chain with all sizes of eggs. If for any reason production was below store requirements, it was the responsibility of the producer to obtain a similar quality of eggs from other sources. Two smaller cartoned egg accounts were served. However, it was necessary to sell some of the small eggs to dealers and a few eggs were sold through a roadside vending machine.

All eggs were prices on the basis of New York Urner-Barry Extra Fancy Heavy-Weight White egg quotation. A slight premium was received over the prices of many market operators in the area.

Operator III had the most highly integrated of the five operations. A large farm, a breeding flock and hatchery had been operated for many years. Net returns had been used for expansion. Breeding operations were discontinued in 1958 to concentrate on market egg production. The funds involved in maintaining a genetics staff and equipment and in merchandising chicks were transferred to market egg production.

This firm had facilities for housing approximately 100,000 hens in 1958, and a building program was under way to provide housing for an additional 80,000 market egg birds.

One strain of birds was used and all feed was manufactured by the firm. To operate the feed mill at an economical level, feed was manufactured for a

large packer, a local dealer, and for a few large egg producers. Much of the grain used in the feed mixing was grown on the farms of the operators including about 100,000 bushels of corn. Pullets were grown on a separate farm. A shop was maintained for repairing old and making new equipment.

Eggs were brought from the laying houses to a refrigerator once a day in 48-egg filler-flats. Dirty eggs were washed in a sanitizer-detergent. All market eggs were candled usually the day after being laid.

Many eggs were sold for biological uses at a premium of approximately 30 cents per dozen over regular market eggs.

Market eggs were cartoned for sale to local retailers. If more than enough eggs were available for these outlets, the extra eggs were sold to the cartoning plant of a large retailer. If too few eggs were produced to supply the cartoned outlets, eggs were bought from local producers with large flocks.

The cartoned eggs were priced on the basis of the New York Urner-Barry Fancy Heavy-Weight White egg quotation.

Operator IV with 250,000 hens had the largest flock among those visited. It was the only cage operation among the five. It was started in 1945 with 500 hens, and the number of hens was increased each year between 1945 and 1958. The largest increase was 66,000 in 1958.

It was started because the operator believed that there was an opportunity for a good return in egg production. Savings resulting from the integrated operation were used for expansion.

Several strains of layers were used. Some former strains had been dropped, however, because of reports of low broken-out quality from the firm which marketed the eggs. All hens were fed the same ration, but formulas varied over time with changes in prices of locally produced grains. The feed was formulated to produce light color yolks.

Eggs were gathered twice daily in filler-flats. Dirty and checked eggs were separated during gathering. Clean eggs were sprayed with mineral oil immediately after gathering and placed in the cooler. Dirty eggs were washed soon after gathering and then oiled. Pullets were replaced in one year.

All feed was manufactured on the premises. Facilities for storing grain were available so that advantage could be taken of local price variations. A shop was maintained for manufacturing and repair of equipment. Cages and houses were built with hired labor.

Approximately 90 percent of the eggs were of Grade AA quality and only eggs with bloodspots or poor shells were removed in the grading process.

All eggs were sold to a large marketing firm. The eggs were graded and cartoned on the farm in a building leased to the marketing firm. Most of the eggs were sold to chainstores by the marketing firm and usually were in retail stores by the second morning after they were laid.

Egg prices were based on prices to retailers as reported by the Agricultural Marketing Service, U. S. Department of Agriculture.

Program V was operated by a large local feed manufacturer. In 1958, this firm owned 175,000 hens on three farms and marketed the eggs from another flock of 60,000 hens. Both were expanding production facilities in 1958.

This firm originally purchased eggs from local producers to whom it sold feed. However, many of the producers used the organization as a surplus outlet and the quality of the eggs often was low. A good marketing program could not be built on a fluctuating volume of eggs of variable quality. Therefore, the firm discontinued buying eggs from all but one producer and started its own production program.

In 1958, three strains of pullets from major breeders were used. All were fed the same ration. Pullets were replaced annually.

Eggs were gathered twice daily and all were washed immediately in a sanitizer-detergent. The room used for washing and holding eggs was air-conditioned but temperatures were often considerably above 60° F. The eggs were taken from the farms to the plant daily except Sunday. Most eggs were graded the day after they were laid. Birds were housed in units of several thousand layers of one strain and eggs from each house were graded as a unit. Yields of Grade A or better eggs ranged 87 to 94 percent for each house.

Most eggs were cartoned and sold to two retail food chains. Some eggs, including checked eggs, were cartoned for local sales. A few eggs were sold to other egg handlers. Eggs were delivered to the stores of one chain buyer and were picked up at the plant by the other.

Eggs were priced on the basis of the New York Urner-Barry Extra Fancy Heavy-Weight White egg quotation.

This firm was building a new egg plant and a hatchery for broiler chicks in 1958.

Summary of Owner-Integrated Operations

Three of the five organizations obtained the capital needed to finance their operations through businesses associated with market egg production. One, because of type of business organization and operation methods, was able to accumulate capital from market egg production. Another accumulated the capital from a nonagricultural operation.

All of the egg producers were controlling seasonal distribution of production of sizes and total volume of eggs through nearly continuous brooding operations. Pullets were generally replaced more frequently in the owner-integrated operations than in either contract-production or contract quality-control programs.

Feeding operations were highly standardized in four of the five owner-integrated programs. These four organizations manufactured their feed.

Quality-control practices for eggs from laying time to cooler were generally less stringent than for many contract production or contract quality-control programs. However, the closely-knit organization of the owner-integrated operations permitted more control of actual operations. It also permitted faster movement of eggs into retail channels.

Grading costs were low in the owner-integrated operations because grading was generally only for size and for removal of eggs with bloodspots and poor shells. Assembly costs were low because eggs were moved only from large production units to a central grading point either on the farm or nearby.

PROBLEMS AND PLANS FOR CHANGES

Few operators were entirely satisfied with their programs. Many of the contract marketing and quality-control program managers indicated that better field supervision was needed. Several midwestern operators believed that the way to solve the outlet problem for their quality-control eggs was to develop a special organization to handle the eggs in eastern markets.

Bargaining Ability

Several managers, particularly among the cooperatives, believed that producers need stronger organizations to bargain effectively with large volume buyers. Six bargaining groups in New Jersey had a membership producing approximately 20,000 cases of eggs per week. One federation of bargaining cooperatives in California represented producers of approximately 12,500 cases of eggs per week. Each had several types of contracts in which prices varied with methods of grading. Some of the cooperative managers interviewed believed that a well-integrated operation among present cooperatives would give producers more strength. They believed such organization would result in both greater volume within one group and in better quality-control. It would also provide the cost-lowering advantages of vertical integration.

Payments to Producers

Methods of determining payments to producers in the contract production programs generally were considered experimental. Decreases in payments to producers for providing labor, facilities, and materials from previous years among the older programs is probably an indicator of lower future payments among most contract production operators.

Further Integration or Specialization

One contract production operator believed that it would be necessary to add feed manufacturing and hatchery operations to compete effectively in the years ahead. He thought that margins between costs and returns would narrow. Another contract production operator was seriously considering shifting to an owner-integrated operation to reduce costs. The major reason for not having made the change was the problem of financing the large investment needed for facilities. One contract production firm contracted in 1958 with a large meat packer to market its eggs. The operators believed that as the local area moved from deficit to surplus production, an agency which covered a wider distribution area was needed.

Testing New Possibilities

Operators of contract production and owner-integrated programs placed considerable emphasis on developing means for lowering costs of producing high quality eggs. At least three of them had built or were building brooding and laying houses to control temperature and light. In each instance this was considered a test of the efficiency of such units.

Most operators were testing various strains of birds. Several of those who used more than one strain believed that they would eventually use a single strain. Some had already discontinued particular strains. In many instances, operators reported that one strain was weak in a characteristic while another reported the same characteristic as the strain's strong point. This is probably a reflection of the dynamics of breeding programs, the incomplete testing methods used by some operators, or the presence of strain and location interactions.

Selling Hens

The conflict between a high level of production of high grade eggs and depreciation costs per hen generally was settled by selling the birds at a younger age and absorbing the higher depreciation cost. Some firms sold most of their hens to local outlets. The best outlets for others were soup or canning companies. One cooperative organization had its own canning operations.

Labor Costs

Two of the owner-integrated operations were located in areas with generally good opportunities for employment in nonagricultural industries. Both had difficulty in retaining a good labor force. One paid farm laborers \$1.00 per hour and the other paid \$1.25 per hour. The manager of one of these organizations believed that the best solution to his labor problem was relocation.

Concentrating Production

Some contract quality-control operators believed that they could obtain an economic advantage by concentrating production near their plants and were developing programs to encourage expansion of flocks in the immediate vicinity.

APPRAISAL OF EGG PROGRAMS

The trend toward a greater degree of vertical integration in egg production and marketing has grown out of many conditions. Among these conditions are:

- (1) Opportunities to lower costs through more efficient operations encompassing both production and marketing.
- (2) The need for financing many producers in order to insure more efficient operations.
- (3) An increasing awareness among retailers of the need for uniformly high quality eggs.
- (4) The increasing size of retail operations which gives retailers greater power in enforcing their demands.
- (5) Inadequacies of candling as a standardization method.
- (6) Inability of pricing methods to induce production of uniformly high quality eggs and a uniform seasonal distribution of volume and sizes.
- (7) The ability to sell more feed by developing contractual arrangements.

These conditions provided the opportunity for developing new ways of producing and marketing eggs. But before new ways could be developed, it was necessary for individuals to visualize possible advantages of coordinated programs. It was also necessary for them to have the courage to undertake new methods, the ability to obtain the necessary capital and the willingness to assume the risks of a new program.

Continued Increase in Vertical Integration

The advantages of well coordinated programs over traditional egg production and marketing operations are likely to result in continued development of these programs.

Cost advantages.--Greater coordination of both production and marketing activities through vertically integrated operations can lower costs. The important consideration is the total cost of production and marketing combined. Quality-control provisions have resulted in lower grading costs. Most integrated operations have larger than average size flocks. Larger flocks lower procurement costs and in many instances decrease production costs. Decision

making in contract production and owner-integrated operations generally is centralized. Operations can be dovetailed to remove inefficiencies. Many of the overhead, selling, and other transfer costs of nonintegrated operations can be eliminated.

Most contract production and owner-integrated operators have lower feed costs than smaller producers in the same area. Operations are large enough that feed can be economically manufactured or purchased at lower prices. Several cooperative marketing associations sell producers feed at usual market prices but because of savings in production and delivery operations return patronage dividends which, in effect, lower egg production costs by 1 to 2 or more cents a dozen.

Quality-control programs permit less total hand labor and lower costs of market operations. In some instances, top quality eggs are individually handled only at the time they are gathered on the farm or ranch. All other handling is done by mechanical equipment. The outstanding example was the west coast cooperative which was able to wash eggs for producers, in addition to all the services formerly performed, and still lower plant costs per dozen eggs.

Quality demands of retailers.--Consumer studies show that many consumers buy eggs from sources other than food stores. Some retailers believe that the best way to obtain more of the egg business is to offer consumers uniformly high quality eggs at reasonable prices. They want this trade not only for the value of the egg business itself but also to help build store traffic.

Several food chains have moved their egg procurement programs closer to producers to assure themselves of a supply of high quality eggs at reasonable prices. Many independent food retailers and dairy companies also emphasize quality in their egg merchandising programs.

Retailers are generally keenly aware of the actions of their competitors. If a competitor appears to have an advantage because he is offering eggs procured through a quality-control program, a source of eggs produced under similar conditions will be sought. If usual suppliers do not have a quality-control program, the retailer likely will seek new suppliers. This provides a powerful incentive for the supplier to develop a program. Otherwise, he may have to sell eggs at reduced prices.

Standardization problem.--If eggs produced under varying conditions could be easily and well standardized by candling, there would have been less need for quality-control programs to obtain the quality of eggs desired by retailers. Candling is an effective method of separating inedible and poor quality eggs from good quality eggs. It is not an effective method of separating good eggs from excellent eggs. Nor can candling predict changes which may occur in eggs after they are candled even though the eggs are properly handled after candling. These changes may stem from production or handling practices which took place before the eggs were candled. In most of the programs studied, the integration of production, handling, and marketing practices was in part designed to correct these difficulties. Since acceptable quality is necessary to hold retail outlets and since pricing by grades has not

achieved the desired results, continued emphasis on quality-control through specification production can be expected.

Seasonal production.--Direct dealing with retail outlets by country-point egg buyers emphasizes the importance of the difference between the seasonal distribution of production and the demand for eggs. Buyers have become more interested in solving the problem of a large proportion of the year's small and medium eggs being produced in the fall. While these efforts have not yet greatly affected the pattern of total production, many of the programs have been successful. More buyers can be expected to turn to contractual arrangements to assure more nearly even seasonal distribution of supplies.

Probable Impacts of Egg Programs

Integration of production and marketing operations will affect all segments of the egg industry.

Egg production costs likely will be lowered by contract production and large owner-integrated operations. Total egg production may increase faster than population increases. Because of the low price elasticity of demand for eggs, increased production per person could result in proportionately greater declines in egg prices than the increases in egg production per person. Unless there is a major change in consumption habits, methods developed for making eggs more convenient to use, or new markets developed, egg prices may decline in the years ahead. It does not appear realistic to expect egg consumption per person to increase the way broiler consumption has in recent years. Broilers substitute directly for other meats. Substitution between eggs and other foods is less direct.

Despite lower egg prices, many operators who are able to dovetail their production and marketing operations and take advantage of the cost lowering possibilities of an integrated operation may have fairly good net incomes. On the other hand, many producers and market operators may go out of the egg business.

Producer changes.--The number of egg producers has been declining and the number of eggs produced per farm has been increasing for many years. Growth of integrated programs may accelerate this trend.

Well managed, large owner-integrated operations may have cost advantages over both contract production and contract quality-control operations. Much of the cost advantage stems from lower procurement costs for eggs, lower delivery costs for feed and greater efficiency in using mechanical equipment.

These large organizations can produce a highly standardized product and economically move it quickly into consumption channels. A farm which reports income on a cash basis and reinvests much of its net income in the business pays relatively low Federal income taxes during its expansion period. Further, an annual management return of only 10 cents per hen equals \$25,000 on a 250,000 hen operation. The same return per bird on a 5,000 bird flock gives the producer a management return of only \$500.

These apparent advantages of large owner-integrated farms may result in increasing numbers of them. Their growth may be largely dependent upon willingness to assume the greater capital risks compared to contract production, ability to obtain the necessary capital, and availability of acceptable labor.

The use of hired labor by large owner-integrated firms may result in production and quality-control disadvantages compared to contract production or contract quality-control operations in which the individual operator has his own funds invested. It is possible that these disadvantages may be offset by giving employees incentive payments based on efficient production of top grade eggs. It also may be necessary to pay higher wages to hold workers than labor returns which self-employed labor will accept.

Paying producers on a volume differential basis undoubtedly will encourage the continued development of larger flocks. Many of the volume differentials are likely to decrease and be no higher than handling cost differences as flocks generally become larger. Incentives for following quality-control practices are likely to shift from price premiums to requirements which must be met to sell table eggs.

Producers on contract quality-control programs in the Northeast receive higher prices at the farm for eggs than some contract production or owner-integrated operators in other areas received at the assembly-distribution plants. The northeastern prices were also considerably higher than those received by midwestern quality-control producers. These differentials are likely to decline as additional, well-coordinated production and marketing programs develop outside the Northeast. The southern region also likely will experience lower relative prices as it shifts from deficit to surplus production.

The only major surplus egg producing area in the country is the Midwest. Individual producers in this area who use the best feeding alternatives have a feed cost advantage over producers of similar sizes in other areas. Costs of production in relatively small flocks (1,000 to 5,000 hens) in the Midwest will probably continue to be at least as low as similar operations in any section of the country. They will likely continue to be a sideline to overall farming operations. If these producers use family labor, good quality-control practices, and participate in a well-coordinated marketing program, they will be difficult to displace. The major disadvantage is their distance from eastern markets.

Low production costs and relatively good quality-control programs have enabled southern producers to replace much midwestern production in their own areas. They may soon become important competitors for major northeastern markets. The West Coast is not likely to return to the large deficit position of a few years ago or ship large volumes of eggs to the East Coast again. West coast producer operations are large, relatively low in cost, and production and marketing generally well-coordinated. The area does not now have the quality advantage which permitted it to ship eggs to the East Coast from the 1920's to early 1940's.

The Northeast is the major deficit egg producing area of the country. The large cities in this area are the market targets of many midwestern and southern programs. Producers in the area do not presently have the low housing cost advantage of the South or the low feed cost advantage of the Midwest. They, as well as the midwestern producers, have generally been accustomed to higher incomes than contract producers of the South. The Northeast has been slower to adopt coordinated production and marketing programs than other areas. Whether producers of this area retain the 1958 proportion of total egg production will depend on the kinds of programs followed, and the importance of lower transfer costs and ability of nearby country-point operators to provide better service to retailers.

More producers may enter into contract production programs. The greatest development of these programs is likely to occur in the South and other relatively low income areas. Contract production is not likely to become as important in egg production as it was in 1958 in broiler production, however.

Many of the eggs consumed in the Nation likely will continue to come from smaller producers with direct sales outlets. This will be particularly true for smaller cities. The extent of this type of operation will be partially governed by markup policies of large retailers. If eggs generally are used as leaders in other sections of the country as they have been on the West Coast or as broilers and turkeys have been in other areas, direct producer to consumer sales are likely to decline.

Breeding and hatching operations.--Quality-control programs demand greater emphasis on breeding for interior egg and shell quality. Larger operations also emphasize high-level, efficient egg production. Combining all the desirable attributes into one strain of chickens requires a professional staff, large numbers of breeding birds, and detailed record keeping. A large operation appears necessary for low breeding costs. This means a continued trend toward larger and fewer breeders. It probably also will mean lower costs in the long run for a given quality of chick.

It appears obvious that the wide seasonal swing in the proportion of replacement-chick hatchings results in higher cost operations than an even seasonal distribution of chick production. Hatchery operation costs are higher because much of the capacity is unused during more than half of each year in many hatcheries. Hatching egg costs are increased because only a relatively small proportion of the eggs from supply flocks are used for hatching purposes. As more programs develop and replacements are planned more systematically, hatching costs will be reduced. Because of excess hatching capacity, many hatcheries may go out of business.

It is also probable that hatching operations will become an integral part of larger integrated production and marketing programs.

Egg handling operations.--Country-point egg handlers who do not develop quality-control programs will likely need to sell most of their eggs to institutional users, Armed Forces and egg breakers. Those who develop quality-control programs will need to build outlets as their programs grow.

Increased use of mechanical equipment is likely to result in larger egg handling plants to take advantage of cost-lowering possibilities of the equipment.

Direct trading between country-point plants and large retailers is an integral part of many of the quality-control programs and can be expected to increase in importance. This probably means a further decline in the proportion of total eggs moving through city wholesalers. It also means a continued increase in the proportion of eggs graded and cartoned at country points.

There may be a tendency for egg-breaking plants to enter into programs so that they may operate their plants on a year around basis and obtain high quality eggs at cost of production. However, if per capita egg production increases and if it becomes more difficult to move nonprogram eggs through normal retail channels, egg breakers may be able to buy eggs of satisfactory quality at lower costs than they can produce them during the adjustment period. Another possibility might be to obtain eggs from second-year layers of program operators.

Pricing problems.--Nearly all eggs which move through regular retail channels are priced on the basis of some wholesale quotation or price. This pricing may be at the producer level, retailer level, or both. With a continued decline in the proportion of eggs and a different quality of eggs moving through wholesale channels, serious consideration will need to be given to different methods of arriving at prices.

Policies of feed companies, hatcheries, and egg plants.--Contractual arrangements among feed companies, hatcheries, and egg buyers are likely to make it more difficult for the three segments of the industry to operate independently. Sound programs will base plans on realistic prospective prices. Average prices received in recent years are not a good indicator of future prices. One program in which producers were guaranteed a minimum price failed. A major reason for failure was the decline in egg prices. Programs which encourage egg production by estimating returns based on too high egg prices may also fail. Programs which do not coordinate marketing with production are less likely to be successful than well-coordinated programs.

APPENDIX

Payment Basis for Individual Contract Production Programs

Each contract production program included provisions which must be viewed as part of the individual program.

In program A, in which the producers received \$200 per month per 2,000 hens for all months except the first one, the units were either 2,000 or 4,000 hens. The producer provided the laying house, equipment, refrigeration facilities, bulk bins for feed, electricity for refrigeration and lights, litter, nest material, water, and all farm labor. Producers also delivered eggs to the plant.

The owner furnished ready-to-lay pullets, feed, medications, and egg cases and materials. The eggs were graded in the plant. Field supervisors were furnished by the company from which the feed was purchased.

No special incentive payment was included because it was believed that the best incentive for the producer to do a good job was his desire to be retained on the program in order to receive the added income.

Program B furnished producers with day-old chicks and all feeds and medications for the chicks and the laying hens. Eggs were picked up at the farm in the owner's cases and materials and graded by the owner. Field supervision was supplied by the owner.

The producer furnished all housing and equipment necessary to grow the chicks and produce the eggs. He also furnished electricity for brooding and lighting, fuel, litter, nest material, water, and all farm labor.

The producer received a base payment of 6 cents per dozen for clean eggs and 3 cents per dozen for dirty eggs in 1958. Bonuses were provided for low mortality, high egg production, and low feed consumption per hen.

A bonus of 2 cents per dozen was earned if mortality from day-old to liquidation of hens was less than 15 percent. The bonus was decreased a half cent per dozen for each 5 percent increase in mortality over 15 percent. Thus, no bonus for low mortality was paid if death loss reached 30 percent.

An egg production bonus of a half cent per dozen was paid for an average of more than 220 eggs in 12 months per hen housed. An additional half cent per dozen was paid for each increase of 10 eggs per hen above this level. A bonus of 2 cents per dozen was paid for an average production of more than 250 eggs per hen.

A bonus of 2 cents per dozen eggs could also be earned by using less than 115 pounds of feed per hen housed from day-old to liquidation. This bonus decreased a half cent per dozen for each 5-pound increase in feed consumed per hen. No bonus was paid unless feed consumption per hen was less than 130 pounds.

The manager reported that most producers received 9 to 10 cents per dozen eggs.

When this program was started, producers were paid 12 cents per dozen for all eggs produced. The operator believed it would be necessary to reduce the producer payment by about 2 cents in 1959.

In program C, the owner furnished day-old pullets, feed for chicks and laying hens, medications, two men to assist in vaccination of the chicks, and field personnel. The eggs were picked up at the producer's farm by two buyers. These buyers furnished cases and materials and graded the eggs.

The producer furnished houses and equipment for the chicks and laying hens. He also furnished fuel, litter, water, nest material and electricity for lighting and all production labor except that furnished by the owner for vaccinating birds.

The producer was paid 9 cents per dozen for Grade A large eggs and 5 cents per dozen for all other eggs. The owner kept a running account of costs and returns. Each producer was presented a copy of his account at the end of each month. After total costs were covered, the producer and owner shared equally in profits. In computing costs, feed was billed at regular retail prices and a markup taken on the chicks which were purchased through a nearby hatchery. Most producers did not receive a bonus.

The payments to producers on this program had also decreased. In 1956, 10 cents per dozen was paid for all eggs. In 1957, payments were 10 cents per dozen for large and medium Grade A eggs and 5 cents per dozen for all others. The 1958 payments were one cent per dozen lower for large Grade A eggs and 5 cents per dozen lower for medium Grade A eggs than in 1957.

In program D, the operator furnished 16-week-old pullets, feed, medication, egg cases and materials, and sanitizer-detergent. He also furnished field personnel and graded the eggs in his plant.

The producer furnished laying houses and equipment, egg washer, litter, nest material, water, refrigeration facilities, and electricity for lights and refrigeration. It was also specified that he should provide good driveways, unloading facilities, all production labor, and deliver the eggs to the owner's plant.

Producers were paid 5 cents per dozen for all eggs delivered. In addition, a bonus based upon the best fifty-two consecutive weeks of production was paid. Under this arrangement it was possible for the producer to earn a maximum bonus of 2.7 cents per dozen. The bonus was based on a combination of eggs produced per hen housed and average number of pounds of feed consumed per dozen eggs. The maximum bonus was paid for a production of 252 or more eggs per hen and a feed consumption of 3.74 pounds or less per dozen eggs. The minimum bonus of 0.7 cent per dozen was paid for an average production of 209 or less eggs and feed consumption of 5.0 pounds per dozen eggs.

The pullets were grown by the program operator on his own farms.

In program E, the operator furnished 10-week-old pullets, feed, medications, sanitizer-detergent, and field personnel. Eggs were picked up at the farm and graded by the buyer. Cases and materials were furnished by the buyer.

The producer furnished houses and equipment, litter, nest materials, refrigeration facilities, egg washer, water and electricity.

The producer was paid 1-1/2 cents per pullet per week for growing the pullets from 10 to 20 weeks. Grade A large, medium and small eggs were paid for at 6 cents per dozen. The producer received 3 cents per dozen for all other eggs.

Producers were paid a feed conversion bonus based on the period from when the birds reached 30 percent production until the flock was sold. The payments were:

<u>Number of pounds of feed per dozen eggs</u>	<u>Bonus in cents per dozen</u>
4.51 to 5.0	1
4.01 to 4.5	2
4.0 or less	3

The operator indicated that since the program was just being started it might be necessary to change the payments.

Pullets for this program were grown for the first 10 weeks on a contract basis by producers other than those on the laying flock program. The pullet growers were paid one cent per week per chick grown.

In program F, the operator furnished 20-week-old pullets, feed, medications, and supervisory personnel. Eggs were picked up at the farm in the owner's cases and materials. Quality grading was done by the owner.

The producer furnished houses and equipment, refrigeration facilities, egg sizing machine, egg washer, litter, nest material, water, electricity, and all production labor including that for sizing eggs.

Producers were paid 6 cents per dozen for Grade A large and medium eggs and 2 cents per dozen for all other eggs. Pullets were grown on a restricted feeding program and did not generally start laying until they were 24 weeks old. Therefore, the number of small eggs was relatively low.

There were no bonus provisions in this program but the operator was planning a monthly bonus rather than the usual year-end bonus. Based on past production records, he believed that he would pay the average bonus for a 73 percent production rate and 4-1/2 pounds of feed per dozen eggs. He would move up and down from that base.

Pullets for this program were all grown on a contract basis. One group of producers grew the chicks to 8 weeks. A second group of producers ranged

them from 8 to 20 weeks of age. Producers in each group were paid one cent per bird per week. Both operations were on a year around basis.

In program G, the operator furnished 20- to 24-week-old pullets, feed, medications and supervisory personnel. Eggs were picked up at the farms by the operator. Cases and materials were furnished by the buyer who also did the quality grading. The operator also built a cement block egg room in each producer's laying house and equipped it with a cooling unit.

The producer furnished the laying house and equipment, litter, nest material, water, and electricity and all production labor.

The producer was paid 6 cents per dozen for all except dirty, checked or bloodspot eggs. He received no payment for the latter. If the producer hand-sized the eggs he received an additional 1-1/2 cents per dozen.

There were no bonus payments in this program.

Pullets were grown on the operator's farms.

Comparison of payment bases.--A more detailed study would be needed to make precise comparisons of returns to producers in the various programs. As can be noted from the description of the programs, the major variables were the age of pullets supplied, farm grading practices, egg delivery, and refrigeration requirements. The major variables in payment were amounts paid and the kinds of eggs for which the payments were made. Estimated annual returns to producers per 1,000 hens are shown in table 2 for each of the programs. An assumed production of 20 dozen eggs per hen was used for all computations except for programs A and D. In program A, producer returns were not based on the number of eggs produced. In program D, a production of 19 dozen eggs per hen was used because producers received 16-week-old pullets.

Because of differences in services provided, direct comparisons can be made only between programs B and C and between A and D.

Sales of Egg Room Coolers

A survey of a sample of 8 manufacturers and dealers for coolers for egg rooms gives an indication of the emphasis on refrigeration in egg programs. Sales among these sample firms increased 12 percent from 1956 to 1957. During the first 8 months of 1958, 16 percent more egg room coolers were sold than in 1957. As may be seen in table 3, a large proportion of the total sales was made in the South and Midwest.

Since flock sizes were generally larger in other sections of the country than in the Midwest, it can be assumed that larger units were sold in those regions. No data were obtained on unit sizes, however.

Table 2.--Estimated average returns to producers for providing labor, facilities and materials in contract production programs, 1958

Program	: Estimated : average annual : returns per : 1,000 hens	: : : :	Major facilities or services which were provided by producers but not included in all programs
	: :		
	: Dollars		
A.....	: <u>1/</u> 1,175		Refrigeration, delivery of eggs
B.....	: <u>2/</u> 1,800		Labor and facilities for growing day-old pullets
C.....	: <u>2/</u> 1,520		Labor and facilities for growing day-old pullets
D.....	: <u>2/</u> 1,290		Refrigeration, delivery of eggs
E.....	: <u>2/</u> 1,490		Labor and facilities for growing 10-week-old pullets, refriger- ation
F.....	: <u>2/</u> 1,080		Refrigeration, size grading
G.....	: <u>2/</u> 1,395		Size grading

1/ Actual amount.

2/ The following assumptions were made for programs B through G:

- B. Mortality between 20.0 and 24.9 percent, 20 dozen eggs per hen, and average feed consumption per hen of 115.0 to 119.9 pounds.
- C. 65 percent Grade A large eggs, 20 dozen eggs per hen, and no bonus payment.
- D. 19 dozen eggs per hen, bonus based on 12 consecutive months' production of 240 to 245 eggs per hen and feed consumption of 4.5 to 4.7 pounds per dozen eggs.
- E. Separate facilities for growing pullets from 10 weeks to laying age, 90 percent Grade A large, medium and small eggs, 20 dozen eggs per hen, and feed consumption of 4.51 to 5.00 pounds per dozen eggs. Fifteen cents per hen was added for the payment made for growing pullets.
- F. 88 percent Grade A large and medium eggs and 20 dozen eggs per hen.
- G. 93 percent clean, sound shell nonbloodspot eggs, 20 dozen per hen and producer sizing of the eggs.

Table 3.--Percent of total egg room cooler sales in different regions, by sample manufacturers and dealers, 1957 and 1958

Region	1957	1958 <u>1</u> /
	<u>Percent</u>	<u>Percent</u>
Northeast <u>2</u> /.....	4	8
South <u>3</u> /.....	36	39
Midwest <u>4</u> /.....	46	42
Far West <u>5</u> /.....	14	11

1/ First 8 months.

2/ Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont.

3/ Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, West Virginia.

4/ Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin.

5/ Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, Wyoming.

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